

# Viruses

## Structure Of A Cell

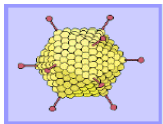
A virus is a nucleic acid surrounded by a coat of protein, often a capsid. Although it may vary. There are two different types of protein within a virus cell. The first type is composed of Hemagglutinin protein (HA) The other type of protein is neuraminidase (NA).

The basic structure of a virus cell is predominantly made up of two shapes; spheres, rods or filaments.

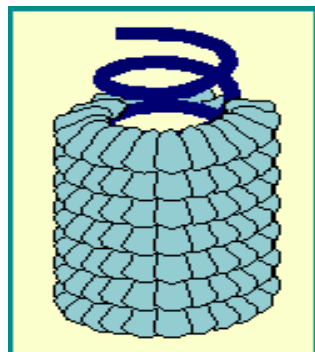
The rod shapes occur from the linear array of the nucleic acid and the protein subunits making up the capsid.

The sphere shape is not actually a sphere, it's a 20 sided polygon (icosahedrons)

It's also unique as it is a non-cellular organism



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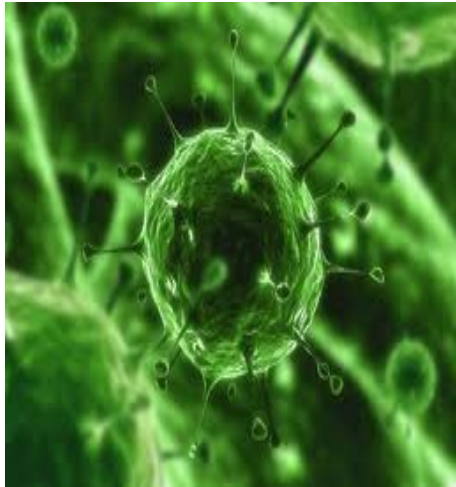


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## Approximate Number Of Species

More than 1,500 species of viruses have been recognized today. Each one can be broken down into subspecies and even further than that. There are about 5 thousand viruses that can be described in detail.

Although there are many different types. Some of these viruses include; HIV, SARS, Smallpox, H1N1, Avian flu, and many more.



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## The Lysogenic Cycle of a Virus:

- The virus attaches itself and injects its DNA into the cell.
- The viral DNA attaches itself to the host DNA, becoming a new set of cell genes called a **prophage**.
- When the host cell divides, this new gene is replicated and passed to new cells. This causes no harm to the cell, but may alter its traits.
- Now there are two possibilities:
  - The prophage survives as a permanent part of the DNA of the host

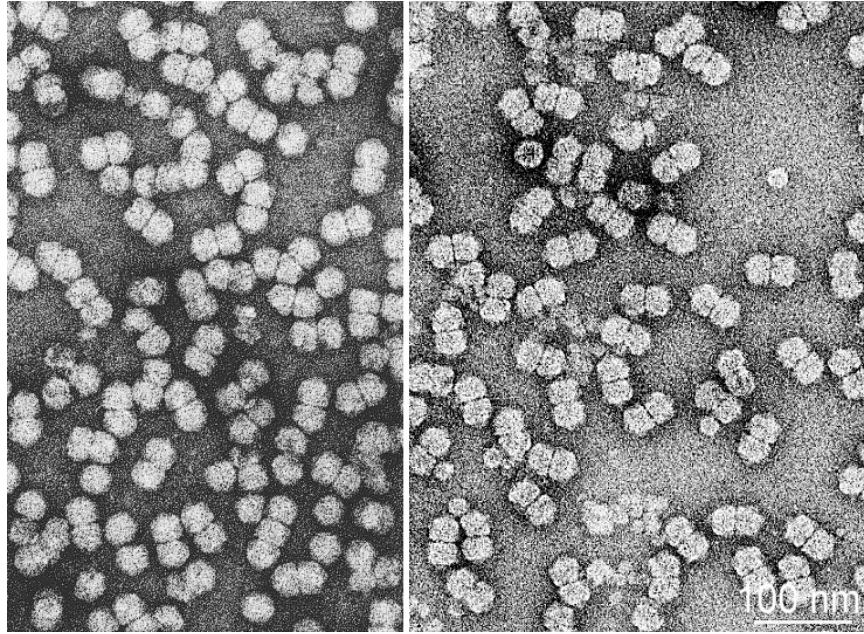
- organism.
- Some external stimuli can cause the prophage to become active, using the cell to produce new viruses.

## Interesting Facts

In 1982, Ivanovski in Russia discovered that a filter would hold back bacteria that would pass the agent that caused mosaic disease in tobacco. That agent was smaller than a bacterium.

In 1911 Peyton Rous discovered that one agent that passed through bacteria filters could cause cancer. But it wasn't till 55 years ago that they realized how critical his discovery was to unravelling the problem of cancer.

Viruses only grow inside of cells. They cannot multiply in the environment. To some extent they are dead objects when not with a host cell. There are many debates whether viruses are alive or dead. This is because when you crystallize them they behave like crystalline protein and are like dead chemical objects.



## Bibliography

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- "Virus Types." *Ohio State Mansfield*. N.p., n.d. Web. 14 Sept. 2010. <<http://www.mansfield.ohio-state.edu/~sabedon/biol3025.htm>  
<<http://eands.caltech.edu/articles/LXVII1/viruses.html>>

## Photos

-<http://health.howstuffworks.com/medicine/modern/light-virus.htm>

<http://health.howstuffworks.com/medicine/modern/light-virus.htm>

Photographer: Sebastian Kaulitzki

-[http://www.biologyjunction.com/virus\\_notes\\_b1.htm](http://www.biologyjunction.com/virus_notes_b1.htm)

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-<http://www.ictvdb.org/ICTVdB/00.029.0.03.037.htm>

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### Evolution Of The Virus

A major factor in how the virus evolves is how their host evolves. Viruses of nearly all classes of organisms, ex: animals, plants etc, probably evolved with their hosts in the sea. The viruses would have emerged from the water with the host considering most of the evolution on this planet started in water. But it is very difficult to tell when the viruses started out as they do not leave any type of fossil and they change so quickly. As we evolve so do the viruses.

### Type of Feeder

Viruses don't fit into any of the groups of feeders because they do not need to eat. Viruses have parasitic characteristics but instead of drinking your blood (such as mosquitoes and other bugs) they just live off of the host cell's energy.



